Meeting Human Resource Constraints in Homeland Security and Defense Science & Technology Development

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3M / CBRTA

CBRTA

Chemical, Biological, and Radiological Technology Alliance

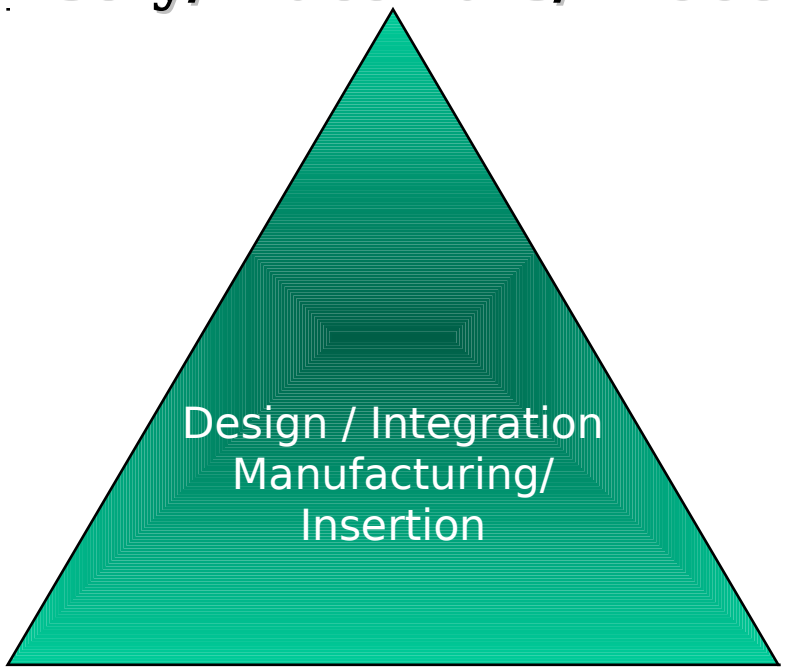
The National Technology Alliance is a U.S. Government Program

Outline

- **Some Unsolved Challenges**
- **How much of the national S&T infrastructure and potential is untapped?**
- **What is government's "entitlement"?**
- **What strategies have proven useful?**
- **Lessons Learned**
- **Examples**

Challenge: Multi-Disciplinary Solutions

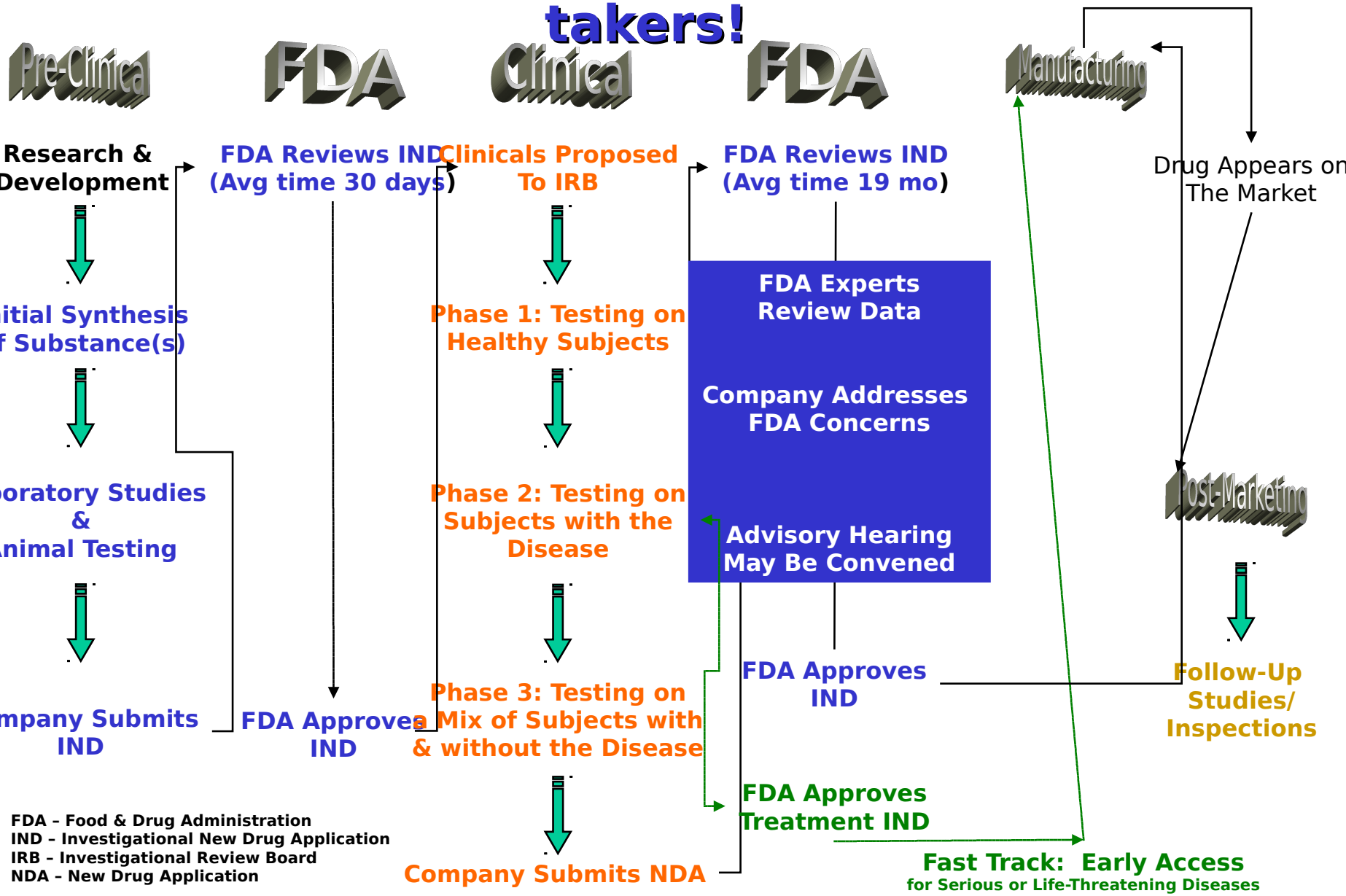
Chemistry/Materials/Processing



Life Sciences

Electronics & Photonics/ Engineering

Challenge: Biodefense Countermeasures – Few takers!

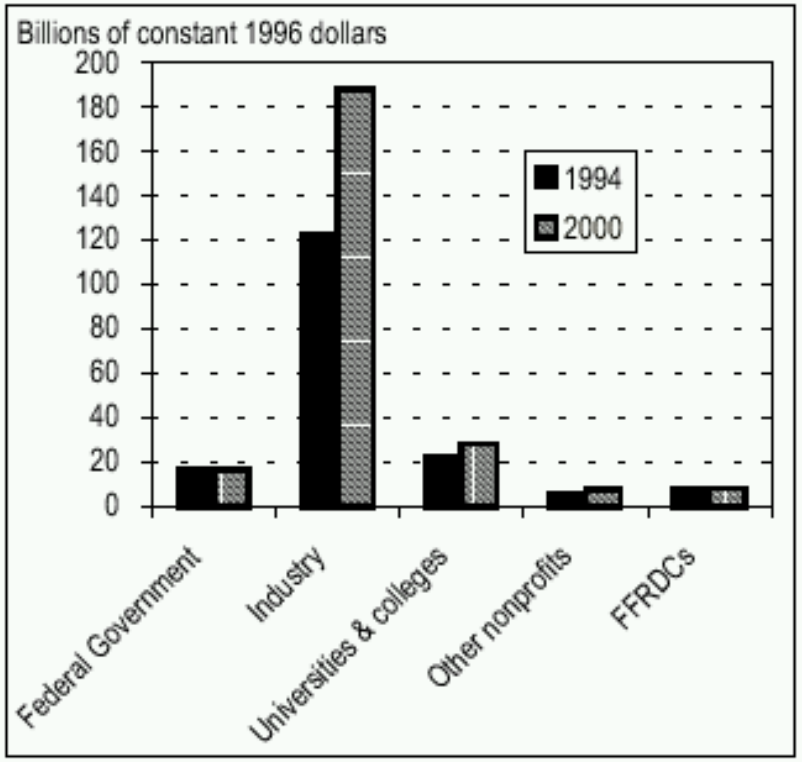

Pre-Clinical
FDA
Clinical
FDA
Manufacturing
Research & Development
FDA Reviews IND (Avg time 30 days)
Clinicals Proposed To IRB
FDA Reviews IND (Avg time 19 mo)
Drug Appears on The Market
Initial Synthesis of Substance(s)
Phase 1: Testing on Healthy Subjects
FDA Experts Review Data
Company Addresses FDA Concerns
Advisory Hearing May Be Convened
Laboratory Studies & Animal Testing
Phase 2: Testing on Subjects with the Disease
Post-Marketing
Company Submits IND
FDA Approves IND
Phase 3: Testing on Mix of Subjects with & without the Disease
FDA Approves IND
Follow-Up Studies/ Inspections
FDA Approves Treatment IND
Company Submits NDA
Fast Track: Early Access
for Serious or Life-Threatening Diseases

FDA – Food & Drug Administration
IND – Investigational New Drug Application
IRB – Investigational Review Board
NDA – New Drug Application

A Quick Snapshot

based on latest government data available

Figure 3. R&D expenditures in constant 1996 dollars by performing sector: 1994 and 2000



NOTE: These data are based on reports from R&D performers. Data for 2000 are preliminary.

SOURCE: National Science Foundation/Division of Science Resources Studies. These data were derived from data collected in four SRS surveys: Survey of Industrial Research and Development, Survey of Research and Development Expenditures at Universities and Colleges, Survey of Federal Funds for Research and Development, and Survey of Research and Development by Nonprofit Organizations.

What Technologies Do US Commercial R&D Companies Drive?

Design for Manufacturing & Mass Production

Massive Parallelism – High Throughput

Digital Output

Remote Access – Tele-presence

Rise in Computational Power/Drop in Cost

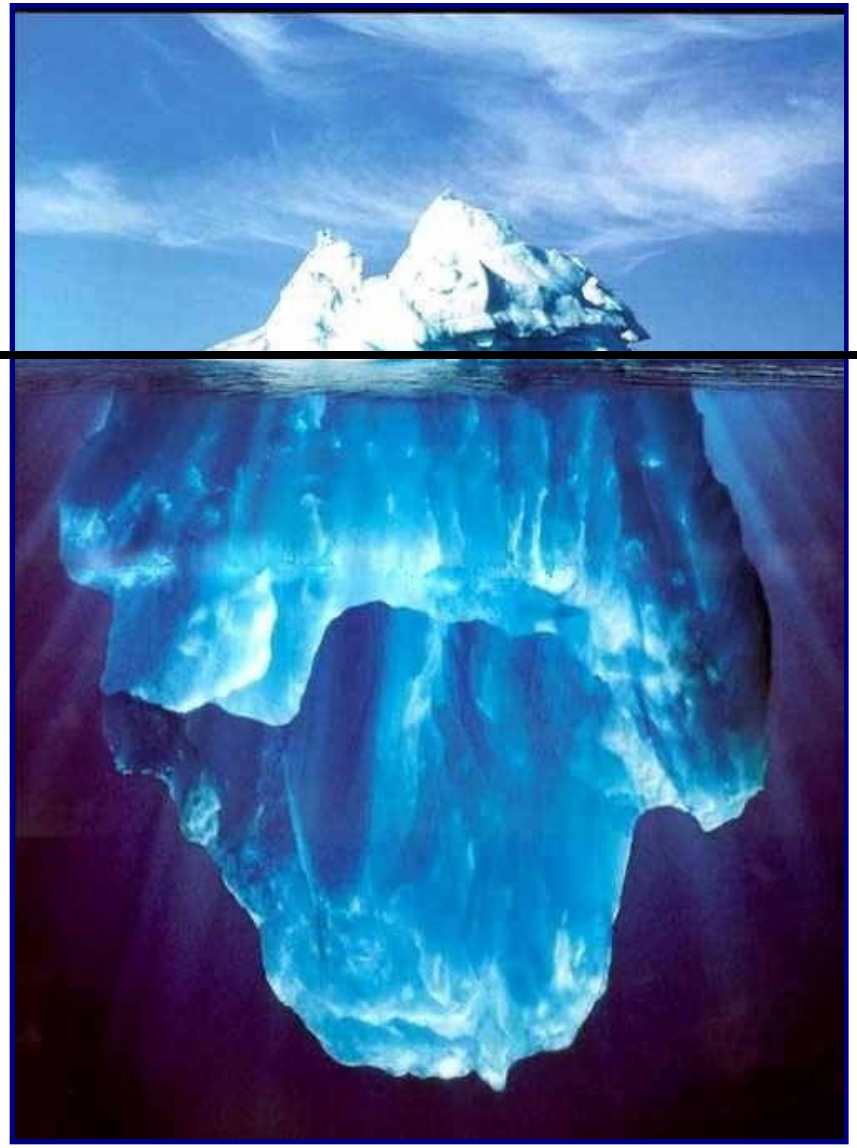
Bioinformatics

Miniaturization

Biotechnology / Genetic Eng. Revolution

Past ***Present*** ***Future***

"Public Persona" of R&D Movers and Shakers



Products

Services

Patents

Publications

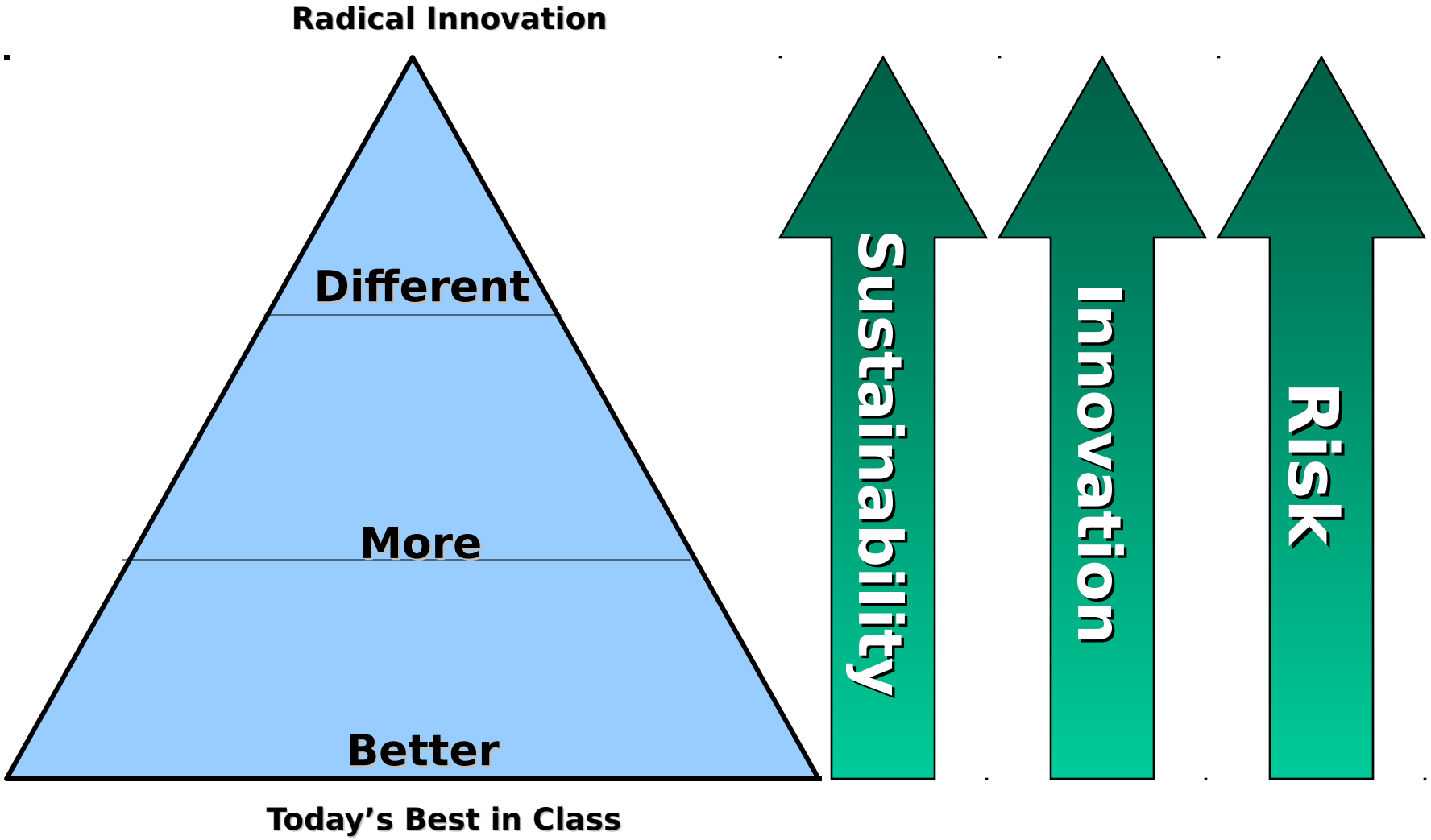
Untapped Potential

Internal Know-How

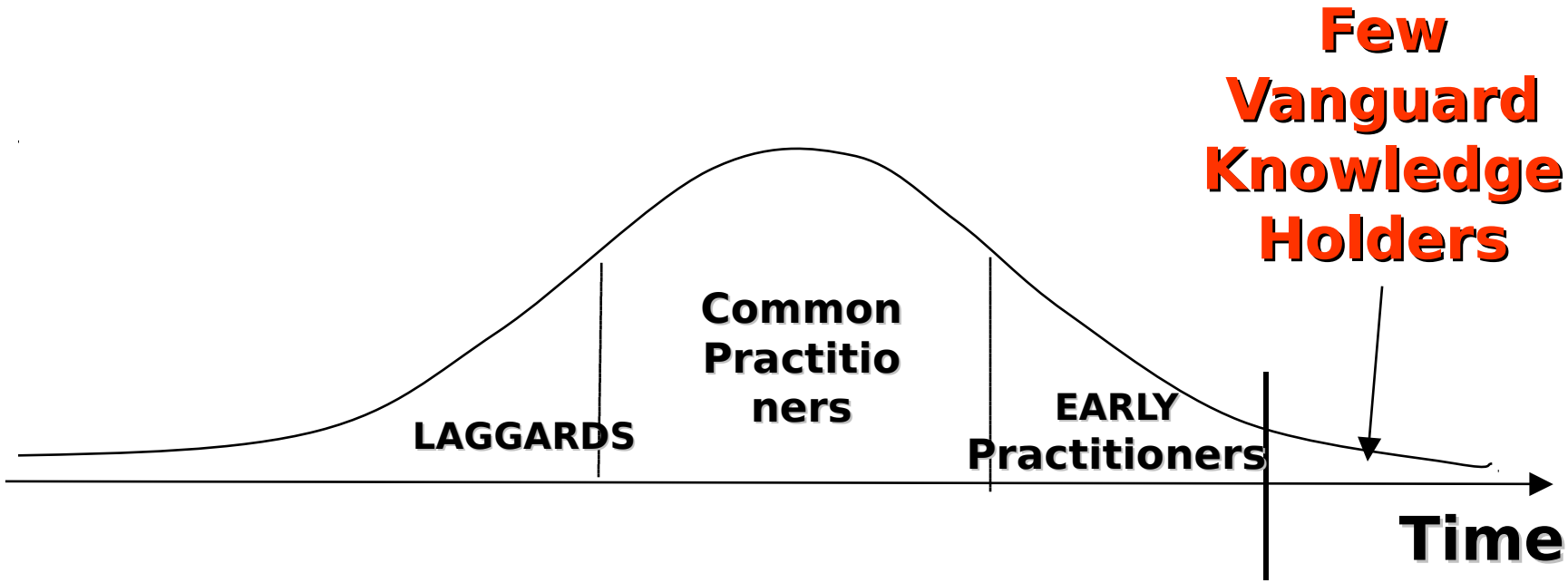
Solve Gov Need
"Fast"
"Dual-Use"
"Lower Cost"

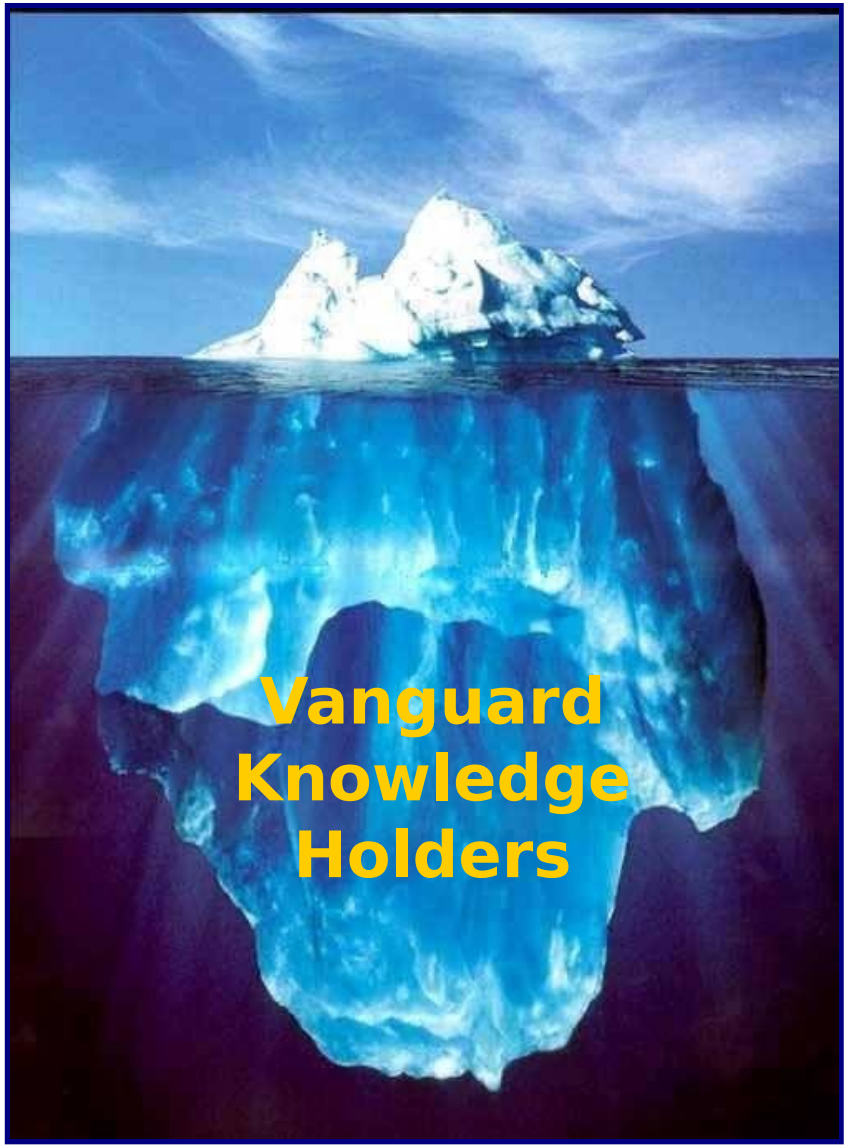
- **Process Technologies**
- **New Technology Platforms**
- **Technology Trend Analyses**
- **Market Research**
- **Product Evolutions Maps**
- **Strategic Plans**

The S&T Demand of New Challenges



Human Resource Constraint





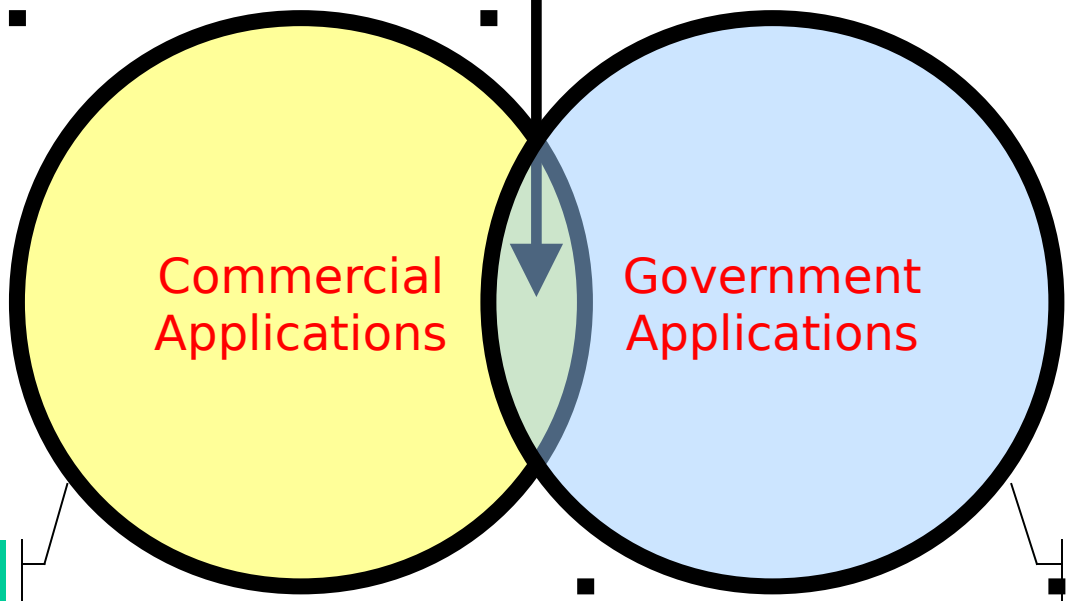
Key Benefits

- **Rich information on emerging & future needs**
- **Higher-quality & often breakthrough concepts**
- **Accelerated product/service development process**

Key Challenges

- **Efficiently finding the "right" lead knowledge holders**
- **Translating & combining many pieces of information**

Dual-Use Technologies



Steward of shareholder dollars. Holder of proprietary technology

- ***Minimizing Risk***
- ***Minimizing Acquisition Costs***
- ***Maximizing Access to Scarce Knowledge Holders***

Steward of taxpayer dollars. Needs access to proprietary technology

National Technology Alliance

Mission:

Influence commercial and dual-use technology development with an emphasis on meeting national security and defense technology needs

Objectives:

- **Acquire knowledge of government operational user needs by conducting technology needs assessment and analysis**
- **Effect rapid discovery, development, and application of commercial technology solutions that are critical to the government operational users**
- **Leverage commercially developed technology and solutions to government technology needs by establishing and maintaining mutually supportive relationships with commercial industry**
- **Provide a forum for the full exchange of government technology needs, solutions, and experimentation with ready access to commercial assistance**

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Chaired by 3M

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Johns Hopkins University
Applied Physics Laboratory

MOTOROLA LABS

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Lucent Technologies
Bell Labs Innovations

GENERAL DYNAMICS

Honeywell Laboratories

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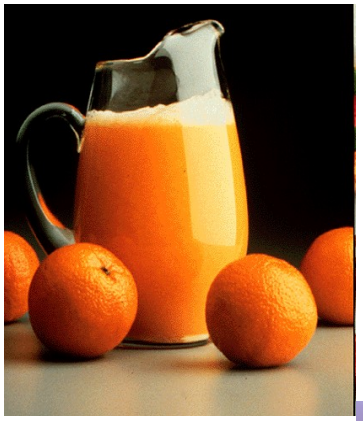
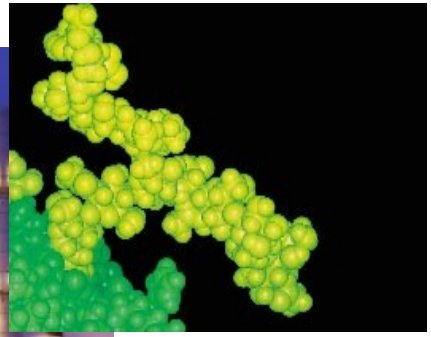
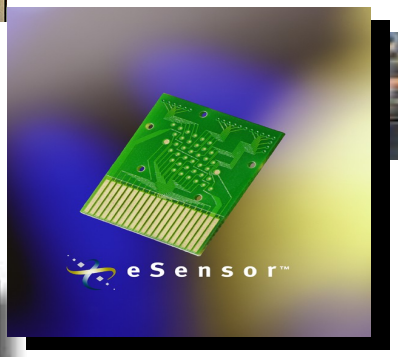
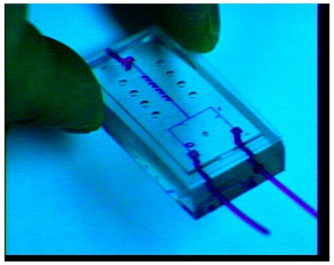
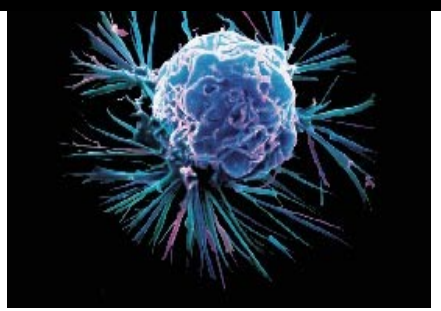
Leverage Proprietary Knowledge











National Technology Alliance

CBRTA

CBRTA

- **Broad Range of Innovative CBR Technologies**
- **Global Presence, Including Manufacturing & Logistics**
  - **Labs and Manufacturing Sites in > 60 Countries**
  - **Annual Commercial Revenue of $200 B**
- **Leverages Existing R&D Investment to Meet U.S. Government and National Security Needs**
  - **CBRTA Annual R&D Budgets Exceed $10B**
    - **>5000 patents**
    - **Over 0.5 million scientists, engineers, clinicians, physicians**
  - **Leverage 5 To 1 Expected; Historically About 9 to 1**
  - **Facilitates Accelerated Product Development**
  - **Report Annually to Congress on progress**

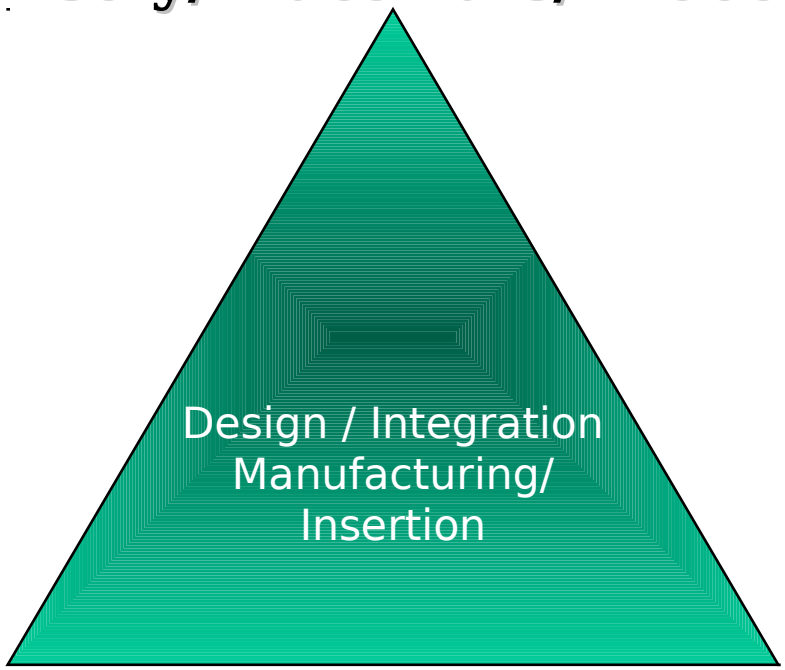
Operating Model: Key Features

- **Program Relevance**
- **Bridge Government Needs Across Agencies (Build Synergy)**
- **Ensure Programs are Complementary to Current and Planned Government Programs**

White House photo by Paul Morse

Challenge: Multi-Disciplinary Solutions

Chemistry/Materials/Processing

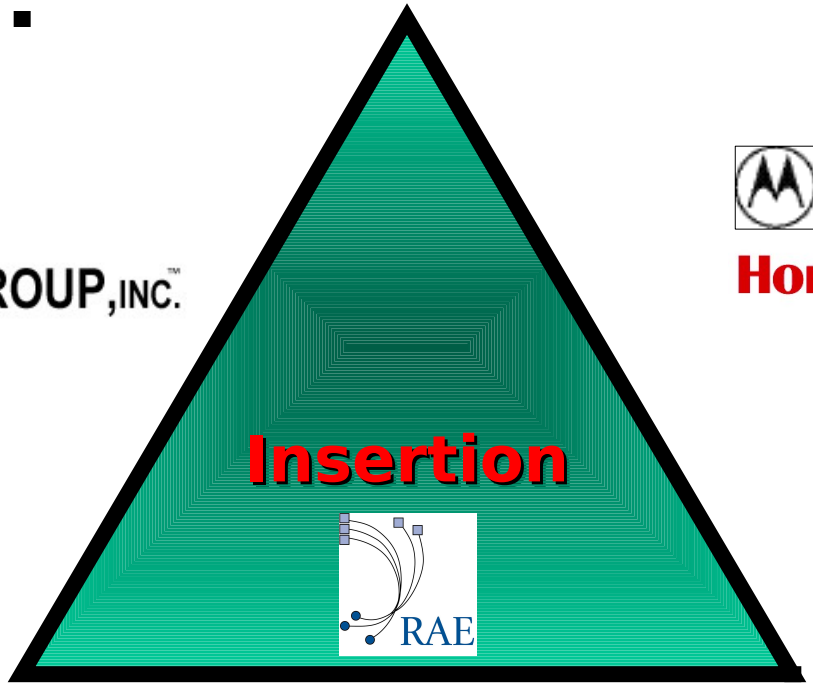


Life Sciences

Electronics & Photonics/ Engineering

CBRTA Member Company Core Skills

Chemistry/Materials/Processing



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Life Sciences

Electronics & Photonics

Key Program Highlights

- **BioAssurety Chain of Custody CBR Tracking and Inventory Management**
  - millisecond inventory interrogation and biometric integration
- **High-Throughput Fully Integrated Parallel Gene Amplification System**
  - fully sample-prep integrated processing from a dozen to hundreds of simultaneous samples in 30 minutes
- **Underground RFID Perimeter Marking & Sensing**
  - 50 year shelf life. No battery requirements
- **End of Service Life Indicators**
  - Reducing logistics foot print by extending useful life to the limit
- **Tamper-Proof Closures and Markers**
  - New applications of proven border security technologies for other end users
- **Portable, Low Power, Audio-Video Integrated Emergency Responder Wall Displays**

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